The Removable Storage Family

Secure Data Storage Combined with Proven Performance

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Digital's Removable Storage Family offers data security and high performance with the (left to right) RA70-based SA705 Removable Storage Array, and the RF30 and RF71 RSEs, housed in the RSE expansion pedestal.

Removability for a Full Range of Digital Systems

Digital's Removable Storage Family provides secure data storage solutions for mainframe and mini computers. The RF30 and RF71 removable storage elements (RSEs) and the SA705 Removable Storage Array allow data to be physically removed from the system and easily transported to a secure area.

These solutions offer Digital's outstanding data integrity, availability, and reliability needed for demanding, critical applications by building on Digital's existing storage family. They also provide investment protection through full Digital Storage Architecture (DSA) functionality.

Together, the RF30 and RF71 RSEs, and the SA705 Removable Storage Array comprise Digital's removable storage offerings, enabling Digital to provide you with an appropriate single-vendor solution to your secure storage requirements.

Highlights

- Security. With disks housed in removable canisters, the data can be quickly and easily transported to a secure area.
- Digital designed, tested, and built. Removable family products are based on Digital's proven storage technology.
- Durability. Each removable storage element is designed and tested for 10,000 insertions and removals.
- High performance. Digital's drives offer extremely high I/O throughput rates, and are designed to maintain the same high level of data integrity found with Digital's other storage products.
- DSA functionality. All removable storage family products are compatible across technological generations, providing unprecedented investment protection both now and in the future.
- Data availability. Through the inherent features of DSA, VAXcluster Systems, and the early warning service capability inherent in VAXsimPLUS, data availability is maximized.
- Data integrity. Multi-level protection guards against data loss.

The canisters protect the high-performance disks from shock, vibration, and static electricity. Pictured above are the RF30 RSE and RA70-RK canisters.

Satisfying the Security Need

Most organizations require data security. And whether your security requirement is highly confidential government or defense data, or sensitive corporate, financial, or health information, Digital's Removable Storage Family provides the answer.

These specially packaged, easily transportable canisters enable sensitive data to be physically removed from the system and then stored accordingly, ensuring it is kept confidential.

Increasing the Amount of Available Data

As technology advances, storage capacity requirements increase. Consequently, a customer's need for online access to this additional removable data grows.

The RSE expansion pedestal provides removable storage starting at 300 megabytes and can easily grow to 2.4 gigabytes. The entry-level computer room SA705 provides 1.1 gigabytes and can expand to 4.4 gigabytes and beyond, based on your data requirements.

With the Removable Storage Family, data can be taken to a secure area after each use.

Removability for MicroVAX Systems

The RF30 and RF71 RSEs are advanced, 5.25-inch integrated storage elements (ISE) housed in protective canisters. By joining the advantages of removability together with ISE technology, the RF30 and RF71 RSEs comprise the best secure storage solution for the MicroVAX environment.*

The RF30 RSE is 150 megabytes of formatted storage, while the RF71 RSE is 400 megabytes of formatted storage. Each brings large system benefits to the MicroVAX system user.

The RF30 and RF71 RSEs use the new Digital Storage Systems Interconnect (DSSI) and host adapters to connect up to six RSEs to a MicroVAX system. The RSEs can be linked to MicroVAX systems with either the Q-bus-based KFQSA or an embedded adapter. This allows up to 2.4 gigabytes storage capacity which can be added to any MicroVAX system. Additional capacity is available through other configurations. The result is increased capacity, increased I/O throughput, increased data integrity, and greater availability.

The RSEs also exhibit excellent multi-drive performance through an embedded controller, which along with DSSI-dedicated transfer channels, allows multiple RSEs to achieve full, simultaneous I/O operation. The result is large system I/O performance in a cost-effective, compact configuration.

The RF30 and RF71 RSEs and the RSE expansion pedestal have safeguards designed in which maintain data integrity, even during removal.

Through several important features the RSEs maintain the same high level of data integrity as the fixed ISEs. These features include automatic bad block replacement and a 264-bit error correction code.

In addition, RSEs check the DSSI bus for incoming commands or data, and physically prevent a canister from being removed while there is bus activity or while the disk is spinning. A light indicates when it is safe to remove the RSE. A heat sensor prevents the RSE from over-heating, increasing long-term reliability, and each canister is shock-mounted for safe transport within the building. A padded carrying case is available for remote transportation.

Availability is maximized through use of VAXsimPLUS, a knowledge-based software tool which analyzes the number and type of errors recorded by the system, predicts failures, and suggests proactive corrective maintenance. Both the RF30 and RF71 RSE designs ensure compatibility with future storage systems through full implementation of DSA.

RSEs are housed in an office-compatible RSE expansion pedestal, each of which holds two RSEs. For investment protection, the removable canister is common for both the RF30 and RF71 RSE. This adds up to the perfect solution for the MicroVAX system requiring secure data storage.

*Currently, DSSI RSEs are supported only on Q-bus-based MicroVAXs.

Removability for Large VAXs, DECsystems, and VAXcluster Systems

Combining the high performance and reliability of the RA70 disk drive, the SA705 Storage Array represents major advances in managing the security of information. The RA70 disk drive is Digital designed and built, and continues to exemplify Digital's commitment to quality storage products.

Housed in a 60-inch high cabinet specifically designed for a computer room environment, the SA705-JA Storage Array packs 4.4 gigabytes into 5.5 square feet. The SA705-HA Storage Array is an ideal entry level solution comprising 1.1 gigabytes with the benefit of adding drives in 280 megabyte increments as your needs grow.

RA70 performance features include high-end cluster capability, standard dual porting, the VAXsimPLUS predictive maintenance tool, minimal field replaceable units, random hot swaps, high I/O throughput rates, and configuration flexibility. Since there are no changes to the RA70 disk drive prior to its being placed in the removable canister (thereby creating an RA70-RK disk drive), the RA70-RK disk drive's attributes are identical to the proven features of the fixed, 5.25-inch RA70 disk drive.

SA705 performance features include a maximum of 590 requests per second at 50 milliseconds average response time, and a maximum of 720 requests per second at 100 milliseconds average response time.

The SA705 Removable Storage Array fully conforms to the Digital Storage Architecture/Standard Disk Interface (DSA/SDI), and the RA70-RK canister can be connected and interchanged between any SA705 and any existing SDI controller (HSC, KDA, KDB, or UDA).

In addition, each disk drive canister contains additional shock, vibration, and electro static discharge (ESD) protection. Heads automatically lock into home position when the drive is spun down, even if the operator failed to follow removal procedures. These features combine to make the SA705 Removable Storage Array the perfect high-end solution for your security-conscious needs.

Tailored Service

The Removable Storage Family is fully warranted and serviced by Digital.

Digital provides one of the most comprehensive portfolios of services in the industry, designed to support customers throughout the computing life-cycle — planning and design, implementation, and ongoing maintenance. Services range from traditional on-site hardware and software services, to multi-vendor and network maintenance support, to facility construc-

The SA705 Removable Storage Array is the perfect solution to data security for large systems.

tion and recovery services, to security consulting services.

The type and amount of support necessary to meet individual needs may be custom tailored. Whatever the service solution, you benefit from a single point of contact.

To Find Out More

For more information on Digital's Removable Storage Family, call 1-800-221-4797 (toll-free) if within the U.S., or 603-884-4791 worldwide. Your local Digital Sales office or authorized Digital distributor can also direct your questions.

Full Configuration Storage Array and Expansion Pedestal Specifications

		SA705 Storage Array	RSE Expansion Pedestal
MAXIMUM CAPACITY			
Formatted capacity		4.4 GB	800 MB
Unformatted capacity [1]		5.6 GB	1064 MB
POWER REQUIREMENTS			
Frequency			
		option xA = 60 Hz	option xA = 60 Hz
		option xD = 50 Hz	option xB = 50 Hz
Voltage			
		option xA = 120 V	option xA = 120 V
		option xD = 240 V	option xB = 240 V
Number of phases		3	1
Maximum current			
		option xA = 10.9 A	option xA = 1.3 A
		option xD = 4.7 A	option xB = .7 A
Power receptacle type			
		option xA = NEMA L21 30P	Standard single-phase power
		option xD = IEC 309	
OPERATIONAL ENVIRONMENT			
Temperature range		<— 10-40°C (50-104°F) —>	
Maximum wet bulb temp.		32°C (89.6°F)	28°C (82°F)
Relative humidity (noncondensing)		10%-80%	10%-90%
Maximum altitude	km	<—2.4 km —>	
	ft.	<— 8,000 ft. —>	
Derating factor	C/m	<— 1.8°C/1000 m —>	
for altitude	F/ft.	<— 1°F/1000 ft. —>	

Full Configuration Storage Array and Expansion Pedestal Specifications, *continued*

		SA705 Storage Array	RSE Expansion Pedestal
Heat dissipation	Btu/h	3737	293
	watts	1082	86
PHYSICAL CHARACTERISTICS			
Height		156 cm (61.5 inches)	61 cm (24 inches)
Width		55.9 cm (22 inches)	15.9 cm (6.25 inches)
Depth		91.4 cm (36 inches)	72.4 cm (28.5 inches)
Weight		381 kg (840 lbs)	39.6 kg (87.4 lbs)

[1] Unformatted capacity is provided for comparison purposes only. Only formatted capacity is accessible to the user in any disk drive.

The office compatible R23RF expansion pedestal holds two RSEs.

The RA70-RK disk drive offers a padded briefcase housing for additional canister protection.

Removable Drive Specifications

	RA70	RF30	RF71
CAPACITY			
Formatted capacity	280 MB	150 MB	400 MB
Unformatted capacity [1]	350 MB	200 MB	532 MB
PERFORMANCE			
Throughput I/O req/sec. [2]	36	32	32
Response time with controller [3]	30.5 ms	35 ms	34.2 ms
Peak transfer rate	1.4 MB/s	1.5 MB/s	1.5 MB/s
Average seek time	19.5 ms	21 ms	21 ms
Average rotational latency	7.5 ms	8.3 ms	8.3 ms
Start/stop time (maximum)	44 s/15 s	15 s/15 s	15 s/15 s
CANISTER CHARACTERISTICS			
Height	10.6 cm (4 in.)	11.2 cm (4.4 in.)	11.2 cm (4.4 in.)
Width	16.76 cm (6.6 in.)	18.4 cm (7.25 in.)	18.4 cm (7.25 in.)
Depth	32 cm (12.6 in.)	26.2 cm (10.3 in.)	26.2 cm (10.3 in.)
Weight	6.8 kg (15 lbs)	3.2 kg (7 lbs)	6.5 kg (14.3 lbs)

[1] Unformatted capacity is provided for comparison purposes only. Only formatted capacity is accessible to the user in any disk drive.

[2] For typical VAX I/O environment, with specification margin and subsystem overhead. The throughput specified is measured with double-buffered single-sector random reads.

[3] The response time specified is measured at the controller interface with single-threaded single-sector random reads.

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